REMARKS

The applicants appreciate the careful examination the Examiner has given to this application and believe the claims as amended will satisfy the Examiner's concerns.

With regard to Section 5 of the Action, claims 1, 5, 8, 9, and 17 have been amended to overcome the Examiner's objections over lack of antecedent.

Claims 2 and 3 depend on the amended claim 1.

Claims 4, 6, and 7 have been amended by introducing additional limitations to better define the invention.

Claims 10-16 have been canceled without prejudice.

With regard to Section 7 of the Action, the Examiner has rejected claims 1, 5, 8, and 10-17 under 35 U.S.C. 102 (b) as being anticipated by Aatresh, U.S. Patent No. 6,067,301 ["Aatresh"].

Claim 1 has been amended by introducing additional limitations to better define the invention and to further differentiate from ["Aatresh"] and other cited prior art.

The method, of the amended claim 1, provides cascaded policing of a service for a two-tier rate guarantee. The two-tier rate guarantee has a per-service rate guarantee and a per-traffic class rate guarantee. The method comprises policing the service at a service rate guarantee (that is, a per-service rate guarantee). Since the service comprises classes of traffic capacity (for example, voice, data, video, etc.), the method further comprises policing each of the classes of traffic capacity at its respective class rate guarantee (that is, per-class rate guarantee). For efficient delivery of the different classes of traffic capacity and for improving the client overall experience with the service delivery, the method utilizes unused capacity for enhancing the delivery of other classes of traffic capacity (e.g., the second class traffic capacity) within the service. This two-tier rate guarantee improves the service delivery of the service rate guarantee paid for by the client for the service, which has multiple classes of traffic capacity.

In contrast, ["Aatresh"] teaches a method for forwarding packets from contending queues of a multi-port switch to an output of a finite bandwidth involving

prioritizing the contending queues into different priorities that relate to priorities of the packets that are being forwarded in the network. The method allocates proportions of the bandwidth to the different priorities, that is, 20% for CTRL, 25% for HI, 15 for MED, and 40% to LO. These are pre-defined bandwidths or queues for managing the different classes of traffic capacities in the network according to their priorities. The method enhances the traffic routing in the network and benefits the network provider.

["Aatresh"] [Figure 6 <<example I>>] illustrates the pre-allocation of the bandwidth to different packet priorities CTRL, HI, MED, and LO. The pre-allocation of the bandwidth is performed by a network manager or dynamically allocated by an operations support systems (OSSs) for enhancing the routing of data packets in the network and hence, enhancing the performance of the network.

In conclusion, the present invention, in the amended claim 1, doesn't re-route classes of traffic capacities between queues and doesn't pre-allocate bandwidths or queues to different classes of traffic capacities as the case in ["Aatresh"]. Advantageously, the invention utilizes unused capacity for one class of traffic capacity to enhance the delivery of the other class of traffic capacity within the service by employing the cascaded leaky buck mechanism for the service and for each class of traffic capacity within the service.

Claims 5 and 8 have been amended by introducing additional limitations to better define the invention and to further differentiate from the prior art.

Claims 10-16 have been canceled without prejudice.

Claim 17 is a system claim having a scope similar to the amended claim 1.

It is respectfully submitted that the anticipation rejection of the Examiner in view of ["Aatresh"] has been traversed.

With regard to Section 17 of the Action, the Examiner has rejected claims 1-8 and 10-21 under 35 U.S.C. 102 (e) as being anticipated by Santiago et al, U.S Patent No. 2002-018666 A1 ["Santiago"].

["Santiago"] teaches policing vertical and horizontal level of a hierarchy of a data stream. The method is provided for policing communications data packets in a network. The classifications of flows and sub-flows are based on protocol layer information and credit tokens techniques as described in paragraph [0077] in ["Santiago"].

Accordingly, conforming and non-conforming rules for packets in the flows and sub-flows, as described in ["Santiago"] paragraphs [0078] and [0082], are not analogous to the traffic classes rate guarantees for the service for the two-tier rate guarantee (i.e., a per-service rate guarantee and a per-class rate guarantee). The policing of flows and sub-flows in ["Santiago"] employs credit tokens, while the present invention employs a leaky bucket mechanism for the policing of the service and for policing each of the classes of traffic capacities within the service.

The above argument applies to ["Santiago"] paragraphs [0009], [0013], [0016] too.

Similarly, the above argument applies to ["Santiago"] [Table 1 |0086, 0090, 0091, 0092] as well as ["Santiago"] paragraphs [0077, 0078, 0082, 0083].

It is respectfully submitted that the anticipation rejection of the Examiner in view of ["Santiago"] has been traversed.

With regard to Section 32 of the Action, the Examiner has rejected claims 2-4, 6, 7 and 18-21 under 35 U.S.C. 103 (a) as being unpatentable over Aatresh (U.S. patent No. 6,067,301) ["Aatresh"] in further view of Santiago (U.S Patent No. 2002-018666) ["Santiago"].

From the previous arguments, ["Aatresh"] and ["Santiago"] combined do not teach the method of the amended claim 1 and do not provide the two-tier rate guarantee for a client's service. The prior art references teach policing of flows and sub-flows of data packets in a network and from protocol layers standpoints. The prior art methods employ routing and re-routing of traffic between queues or pre-defined bandwidths in accordance with the pre-defined traffic priorities.

Claims 2 and 3 depend on the amended claim 1.

Claim 4 depends on the amended claim 1 and has been amended by introducing additional limitations to better define the invention.

Claims 6 and 7 depend on the amended claim 5 and have been amended by introducing additional limitations to better define the invention.

Claims 18-21 depend on the amended claim 17.

It is respectfully submitted that the obviousness rejection of the Examiner in view of ["Aatresh"] and ["Santiago"] combined has been traversed.

With regard to Section 44 of the Action, the Examiner has rejected claims 9 under 35 U.S.C. 103 (a) as being unpatentable over Santiago (U.S Patent No. 2002-018666) in view of Mohaban et al, U.S Patent No. 6,463,470 ["Mohaban"].

["Mohaban"] [column 22 <<lines 52-64>> teaches an aggregate burst tolerance of 100 kbps for policy-based management of quality-of-service (QOS) treatments of network data traffic flows. It is intended for network management and it is set to a fixed value of 100 kbps.

In contrast, the method, in the amended claim 9, teaches policing service at a service burst tolerance guarantee and policing classes of traffic capacity at a per-class of traffic burst tolerance guarantee. The method employs variable burst tolerance guarantees: a per-service burst tolerance guarantee and a per-class burst tolerance guarantee for the different classes of traffic capacity. In addition, the policing is affected based upon cascaded leaky bucket mechanism. Hence, ["Santiago"] and ["Mohaban"] combined do not teach the method in the amended claim 9.

It is respectfully submitted that the obviousness rejection of the Examiner in view of ["Santiago"] and ["Mohaban"] combined has been traversed.

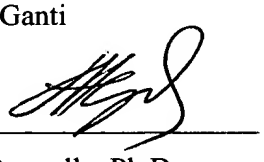
The Examiner is requested to respectfully reconsider this application with regard to the amendments to the claims presented above and the above arguments with a view to considering the claims favorably for allowance.

An **Advisory Action** for this application is respectfully requested at the Examiner's earliest convenience.

The Commissioner is hereby authorized to deduct any prescribed fees for these amendments from our Company's **Deposit Account No. 501832**.

Yours truly,

Sudhakar Ganti

By: 

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AMENDMENTS TO THE CLAIMS

(currently amended) A method of cascaded policing of a service for a two-tier rate guarantee ~~packet traffic~~ comprising the steps of:

(a) policing ~~a~~ the service at a service rate guarantee~~,~~ based upon a leaky bucket mechanism, wherein the leaky bucket has a finite traffic capacity for said service, the ~~service having~~ finite traffic capacity comprising a first class traffic capacity having a first class rate guarantee and a second class traffic capacity having a second class rate guarantee, which is lower than the first class rate guarantee~~, the service rate guarantee being equal to the sum of the first class rate guarantee and the second class rate guarantee~~;

(b) policing the first class traffic capacity at the first class rate guarantee based upon a leaky bucket mechanism, said leaky bucket having a traffic capacity which is equal to the first class traffic capacity;

(c) policing the second class traffic capacity at the second class rate guarantee based upon a leaky bucket mechanism, said leaky bucket having a traffic capacity which is equal to the second class traffic capacity~~if not all of the first class traffic capacity is being used, transmitting a portion of the second class traffic capacity on the left over capacity of the first class, the portion being less or equal to the second class traffic capacity~~; and

(d) if not all of the capacity of the leaky bucket of the first class traffic is being used,

(i) storing ~~policing the remaining portion of~~ the second class traffic capacity, which is not being policed in step (c) into said leaky bucket, and

(ii) policing the traffic capacity in said leaky bucket ~~on the left over capacity of the first class,~~ at an aggregate rate of the first class rate guarantee and the second class rate guarantee.

2. (original) The method according to claim 1, wherein the first class traffic capacity being marked as conforming if allowed by the first class rate guarantee and non-

conforming if found to exceed the first class rate guarantee.

3. (original) The method according to claim 1, wherein the second class traffic capacity being marked as conforming if allowed by the aggregate rate of the first class rate guarantee and the second class rate guarantee and non-conforming if found to exceed the aggregate rate of the first class rate guarantee and the second class rate guarantee.

4. (currently amended) The method according to claim 1, wherein ~~the steps~~the steps (b) and (~~d~~c) comprise policing at ~~the~~ a traffic class rate guarantee and a traffic class burst tolerance guarantee.

5. (currently amended) A method of cascaded policing of a service for a two-tier rate guarantee ~~packet traffic~~ comprising the steps of:

(e) policing ~~a~~ the service at a service rate guarantee~~,~~ based upon a leaky bucket mechanism, wherein the leaky bucket has a finite traffic capacity for said service, the finite traffic capacity comprises ~~the service having~~ a plurality of classes of traffic capacities having ~~a~~ their respective plurality of traffic classes rate guarantees arranged in a descending order of priorities~~, the service rate guarantee being equal to the sum of the plurality of traffic classes rate guarantees~~;

(f) policing at least one of the plurality of classes of traffic capacities at its respective traffic class rate guarantee based upon a leaky bucket mechanism, said leaky bucket has a traffic capacity which is equal to the at least one of the plurality of classes of traffic capacities;

(g) policing each of the remaining plurality of classes of traffic capacities at its respective traffic class rate guarantee based upon cascaded leaky buckets mechanism, each of the leaky buckets has a traffic capacity which is equal to each of the remaining plurality of classes of traffic capacities; and

(gh) if not all of the capacity of the leaky bucket of said at least one of the plurality of classes of traffic capacities is being used, ~~transmitting respective portions of the~~

~~plurality of traffic capacities, which have lower traffic classes rate guarantees, on the left over capacity of said at least one of the plurality of traffic capacities, the portion being less or equal to the sum of the plurality of traffic capacities; and~~

~~(h) policing~~

(v) storing one or more ~~each~~ of the remaining ~~portions~~ classes of traffic capacities of said plurality of classes of traffic capacities, which have lower traffic classes rate guarantees and have not being policed in step (g), into said leaky bucket, and

(vi) policing the classes of traffic capacities in said leaky bucket ~~on the left over capacity of the at least one of the plurality of traffic capacities,~~ at an aggregate rate of the plurality of traffic classes rate guarantees.

6. (currently amended) The method according to claim 5~~, wherein~~, wherein the at least one of the plurality of classes of traffic capacities is marked as conforming if allowed by its respective traffic class rate guarantee and non-conforming if found to exceed its respective traffic class rate guarantee.

7. (currently amended) The method according to claim 5~~, wherein~~, wherein each of the remaining ~~portions of the~~ plurality of classes of traffic capacities is marked as conforming if allowed by the aggregate rate of the plurality of traffic classes rate guarantees and non-conforming if found to exceed the aggregate rate of the plurality of traffic classes rate guarantees.

8. (currently amended) A method of cascaded policing of a service for a two-tier rate guarantee ~~packet traffic~~ comprising the steps of:

(i) policing ~~a~~ the service at a service rate guarantee~~,~~ based upon a leaky bucket mechanism, wherein the leaky bucket has a finite traffic capacity for said service, the finite traffic capacity comprises ~~the service having~~ a plurality of N classes of traffic capacities, C_i, i=1, 2, - -, N and N>2, having ~~a~~ their respective plurality of

traffic classes rate guarantees, R_i, i=1, 2, - -, N and N>2 arranged in a descending order of priorities~~, the service rate guarantee being equal to $\sum_{i=1}^{N} R_i$~~;

(j) policing the C_i traffic capacity at its respective traffic class rate guarantee R_i based upon a leaky bucket mechanism, said leaky bucket has a traffic capacity which is equal to the C_i traffic capacity;

(k) policing each of the C_1, C_2, - -, C_{i-1} traffic capacities at its respective traffic class rate guarantee R_1, R_2, - -, R_{i-1} based upon cascaded leaky buckets mechanism, the cascaded leaky buckets having C_1, C_2, - -, C_{i-1} traffic capacities; and

(~~k~~l) if not all of the capacity of the leaky bucket of the C_i ~~traffic~~ traffic capacity is being used, ~~transmitting a portion of~~

(x) storing one or more of the C_1, C_2, - -, C_{i-1} traffic capacities, which have not being policed in step (k), into said leaky bucket, and

(xi) policing the traffic capacities in said leaky bucket ~~on the left over capacity of the C_i traffic capacity, the portion being less or equal to $\sum_{i=1}^{N} C_i$; and~~

~~(l) policing each of the remaining traffic capacities C_1, C_2, - -, C_{i-1}, which is not in step (k),~~ at an aggregate rate RA_i, which is $RA_i \sum_{i=1}^{N} R_i$.

9. (currently amended) The method according to claim 8, further comprising the steps of:

(m) policing ~~a~~ the service at a service burst tolerance guarantee ~~,~~ based upon a leaky bucket mechanism, wherein the leaky bucket has a finite traffic capacity for said service, the finite traffic capacity comprises ~~the service having~~ a plurality of N classes of traffic capacities, C_i, i=1, 2, - -, N and N>2, having ~~a~~ their respective plurality of burst tolerance guarantees, BT_i, i=1,2, - -, N and N>2;

(n) policing the C_i traffic capacity at its respective burst tolerance guarantee BT_i based upon a leaky bucket mechanism, said leaky bucket has a traffic capacity which is equal to the C_i traffic capacity;

(p) policing each of the C_1, C_2, - -, C_{i-1}, traffic capacities at its respective burst tolerance guarantee BT_1, BT_2, - -, BT_{i-1} based upon cascaded leaky buckets mechanism, the cascaded leaky buckets having C_1, C_2, - -, C_{i-1} traffic capacities; and

(~~pq~~) if not all of the capacity of the leaky bucket of the C_i traffic capacity is being used, ~~transmitting a portion~~

(a) storing one or more of the C_1, C_2, - -, C_{i-1},, traffic capacities, ~~on the left over capacity of the C_i traffic capacity, the portion being less or equal to $\sum_{i=1}^{N} C_i$; and~~

~~(q) policing each of the remaining traffic capacities C_1, C_2, - -, C_{i-1},~~ which is not being policed in step (p), into said leaky bucket, and

(b) policing the traffic capacities of said leaky bucket at an aggregate burst tolerance guarantee BA_i, which is ~~$BA_i = \sum_{i=1}^{N} BT_i$.~~ $BA_i = \sum_{i=1}^{N} BT_i$.

10. (canceled) ~~A policer performing the steps of the method as described in claim 1.~~
11. (canceled) ~~A policer performing the steps of the method as described in claim 5.~~
12. (canceled) ~~A policer performing the steps of the method as described in claim 8.~~
13. (canceled) ~~The policer according to claim 12 implemented as software running on a processor.~~
14. (canceled) ~~The policer according to claim 10 implemented as software running on a processor.~~
15. (canceled) ~~The policer according to claim 11 implemented as software running on a processor.~~

16. (canceled) ~~A processing platform readable medium having stored thereon processing platform executable instructions which when executed:~~

~~(v) police a service at a service rate guarantee, the service having a first class traffic capacity having a first class rate guarantee and a second class traffic capacity having a second class rate guarantee which is lower than the first class rate guarantee, the service rate guarantee being equal to the sum of the first class rate guarantee and the second class rate guarantee;~~

~~(w) police the first class traffic capacity at the first class rate guarantee;~~

~~(x) if not all of the first class traffic capacity is being used, transmit a portion of the second class traffic capacity on the left over capacity of the first class, the portion being less or equal to the second class traffic capacity; and~~

~~(y) police the remaining portion of the second class traffic capacity, which is not being policed on the left over capacity of the first class, at an aggregate rate of the first class rate guarantee and the second class rate guarantee.~~

17. (currently amended) An apparatus for cascaded policing of a service for a two-tier rate guarantee ~~packet traffic~~ comprising:

(r) a policer, policing ~~a~~ the service at a service rate guarantee, the policer having a buffer storage for a finite traffic capacity for said service, the ~~service having~~ finite traffic capacity comprising a first class traffic capacity having a first class rate guarantee and a second class traffic capacity having a second class rate guarantee, which is lower than the first class rate guarantee~~, the service rate guarantee being equal to the sum of the first class rate guarantee and the second class rate guarantee~~;

(s) a policer, policing the first class traffic capacity at the first class rate guarantee, the policer having a buffer storage for a traffic capacity, which is equal to the first class traffic capacity;

(t) a ~~transmitter~~policer, ~~transmitting a portion of~~policing the second class traffic capacity at the second class rate guarantee, the policer having a buffer storage for a traffic capacity which is equal to the second class traffic capacity~~on the left over~~

~~capacity of the first class, if not all of the first class traffic capacity is being used, the portion being less or equal to the second class traffic capacity~~; and

(u) a policer, policing the ~~remaining portion of the~~ second class traffic capacity, which is not being policed in step (t) ~~on the left over capacity of the first class,~~ at an aggregate rate of the first class rate guarantee and the second class rate guarantee~~.~~, if not all of the capacity of the buffer storage of the first class traffic has been used.

18. (original) The apparatus as described in claim 17, wherein the policer comprises means for marking the first traffic capacity as conforming if allowed by the first class rate guarantee and non-conforming if found to exceed the first class rate guarantee.

19. (original) The apparatus as described in claim 17, wherein the policer comprises means for marking the second traffic capacity as conforming if allowed by an aggregate rate of the first class rate guarantee and the second class rate guarantee and non-conforming if found to exceed the aggregate rate of the first class rate guarantee and the second class rate guarantee.

20. (original) The method as described in claim 8, wherein each of the C_i, i = 1, 2, - -, N and N>2, traffic capacities being marked as conforming if allowed by its respective traffic class rate guarantee R_i, i=1, 2, - -, N and N>2 and non-conforming if found to exceed its respective traffic class rate guarantee, R_i, i=1, 2, - -, N and N>2.

21. (original) The method as described in claim 8, wherein each of the C_1, C_2, - -, C_{i-1}, traffic capacities being marked as conforming if allowed by the aggregate rate

RA_i, which is $RA_i = \sum_{i=1}^{N} Ri$ and non-conforming if found to exceed the aggregate rate

RA_i which is $RA_i = \sum_{i=1}^{N} Ri$.

22. (new) The method as described in claim 1, wherein the step (a) comprises policing at a service rate guarantee and a service burst tolerance guarantee.

23. (new) The method as described in claim 5, wherein the steps (f) and (g) comprise policing at a traffic class rate guarantee and a traffic class burst tolerance guarantee.

24. (new) The method as described in claim 5, wherein the step (e) comprises policing at a service rate guarantee and a service burst tolerance guarantee.

25. (new) The apparatus as described in claim 17, wherein the policer is a leaky bucket mechanism.

26. (new) The apparatus as described in claim 17, wherein the policer comprises a buffer storage for storing the first class traffic capacity and another buffer storage for storing the second class traffic capacity.

27. (new) The apparatus as described in claim 17, wherein the steps (s) and (t) comprise means for policing at a traffic class rate guarantee and a traffic class burst tolerance guarantee.

28. (new) The apparatus as described in claim 17, wherein the step (r) comprises means for policing at a service rate guarantee and a service burst tolerance guarantee.

29. (new) A method of cascaded policing of a service for a two-tier rate guarantee comprising the steps of:

(i) policing the service at a service rate guarantee comprising storing the service in a service buffer storage having a finite traffic capacity for said service, the finite traffic capacity comprising a plurality of N classes of traffic capacities, C_i, i=1, 2, - -, N and N>2, having their respective plurality of traffic classes rate guarantees, R_i, i=1, 2, - -, N and N>2 arranged in a descending order of priorities;

(ii) policing the C_i traffic capacity at its respective traffic class rate guarantee R_i, the policing comprising storing said traffic capacity in a C_i buffer storage having a traffic capacity which is equal to the C_i traffic capacity;

(iii) policing each of the $C_1, C_2, - -, C_{i-1}$ traffic capacities at its respective traffic class rate guarantee $R_1, R_2, - -, R_{i-1}$, comprising storing the $C_1, C_2, - -, C_{i-1}$ traffic capacities in (i-1) cascaded buffers storage having the $C_1, C_2, - -, C_{i-1}$ traffic capacities, respectively; and

(iv) if not all of the capacity of the C_i buffer storage for the C_i traffic capacity is being used, storing one or more of the $C_1, C_2, - -, C_{i-1}$ traffic capacities in said buffer storage and policing the traffic capacities in said buffer storage, which have not being policed in step (iii), at an aggregate rate RA_i, which is $RA_i \sum_{i=1}^{N} R_i$.

30. (new) The method as described in claim 29, wherein the policing is effected based upon a leaky bucket mechanism.

31. (new) The method as described in claim 29, wherein the policing comprises storing each of the C_i, i=, 2, --, N, N>2 traffic capacities in a corresponding C_i, and i=1, 2, --, N, buffer storage.

32. (new) The method as described in claim 29, wherein each of the C_i, i = 1, 2, - -, N and N>2, traffic capacities being marked as conforming if allowed by its respective traffic class rate guarantee R_i, i=1, 2, - -, N and N>2 and non-conforming if found to exceed its respective traffic class rate guarantee, R_i, i=1, 2, - -, N and N>2.

33. (new) The method as described in claim 29, wherein each of the $C_1, C_2, - -, C_{i-1}$,, traffic capacities being marked as conforming if allowed by the aggregate rate

RA_i, which is $RA_i = \sum_{i=1}^{N} Ri$ and non-conforming if found to exceed the aggregate rate

RA_i which is $RA_i = \sum_{i=1}^{N} Ri$.

34. (new) The method as described in claim 29, wherein the steps (ii) and (iii) comprise policing at a traffic class rate guarantee and a traffic class burst tolerance guarantee.

35. (new) The method as described in claim 29, wherein the step (i) comprises policing at a service rate guarantee and a service burst tolerance guarantee.